November 30, 1949.

Dr. E. Staten Wynne,
Dept. Plant Sciences,
University of Oklahoma,
Norman, Oklahoma.

Dear Wynne:

Lately I've run across something that I thought might interest you directly, and on which you might be able to give me some advice. We've been trying for some time now to find new coli strains which can be crossed with K-12, and believe to have one in the form of "W-1113", isolated from chicken feces by Sarles and Shapiro. Although prototrophs have been obtained in combinations of biochemical mutants, the yields have always been extremely low. Trying to find the reasons for this, we found that 1113 kills off K-12, seemingly by "direct antagonism."

Encouraged by Allen Marr's remark that you might be interested, I am taking the liberty of sending isolates of K-12 and W-1113. If you are too busy, just file them in the wastepaper basket. [Marr, by the way, is one of our best students, e.g. in a microbial genetics course I'm giving.] The antagonism is best seen on "phage plates": the K-12 suspension is inoculated to give ca. $10^8$/ml in 3-4 ml soft nutrient agar which is poured over a nutrient agar plate. After the agar has hardened, the W-1113 is streaked over the surface. Marr said that the zones of inhibition are unusually clear, and extend a rather long distance from the overlying streak. However, I haven't been able to get an inhibitory filtrate in a few experiments where I was looking for a phage.

The antagonism can also be inferred from selection experiments-- the K-12 disappears from mixtures in growing broth cultures. Detection is facilitated because K-12 is sucrose-negative; 1113 Suc+. EMB with 1.5% sucrose gave the best results.

I am specifically interested in overcoming the technical obstacle imposed by the antagonism. I am particularly looking for K-12-resistant mutants, so far unsuccessfully, but would appreciate any suggestion you might make- whether or not you have time to look at the strains. Can you also send me any available reprints on bacterial antagonism? If you would be interested to look into these strains, I can offer the advantages of having a large number of mutant derivatives of each, marked with various nutritional requirements, fermentative characters, and phage-resistance, and you can have anything along this line that might be useful.

Sincerely yours,

Joshua Lederberg
Assistant Professor of Genetics